LOOK INSIDE

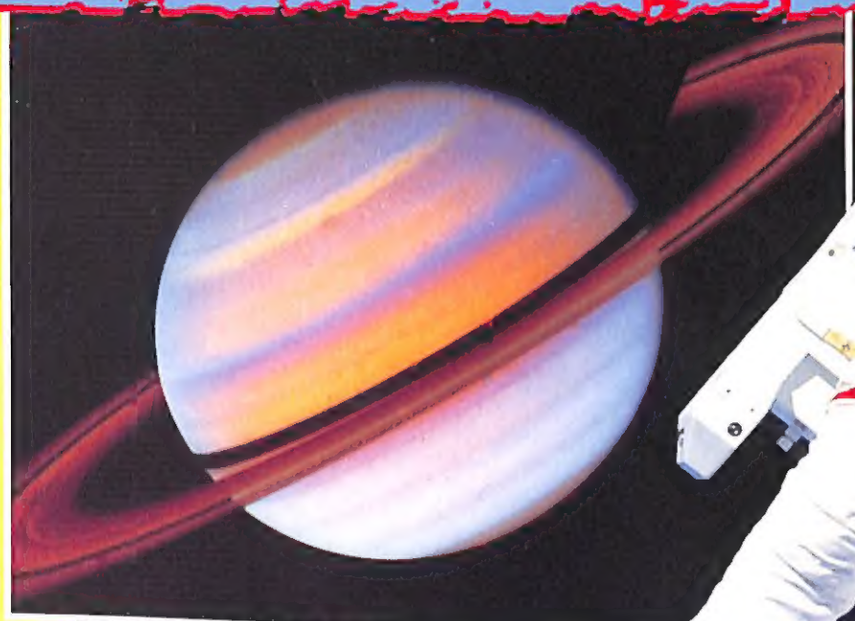
A Marshall Cavendish Collection

EVERY FORTNIGHT

# QUEST

## ADVENTURES IN THE WORLD OF SCIENCE

## MAN IN SPACE 2



GIANT SHUTTLE POSTER

THREE PROJECTS

**FACT FILES:**

- The outer planets
- Surviving in space
- Life of a star
- Mars – Man's next base
- Flying the Shuttle
- Star Wars
- Eye in the sky
- Moon shot
- A place in the universe
- Telescopes for tomorrow


MODEL: STAR TRACKER

UK £1.99 IR£2.25 Aust $4.95 NZ $5.95 Malaysia $7.95 Sing $5.95 Malta Lm1.75

# INSIDE THIS PACK

## FACT FILES

▶Planets ▶Surviving in space ▶Birth of a star ▶ Missions to Mars ▶Space weapons ▶Spy satellites ▶Man on the Moon ▶The galaxies ▶ Telescopes of the future


**MODEL** Star Tracker


**POSTER** The Space Shuttle

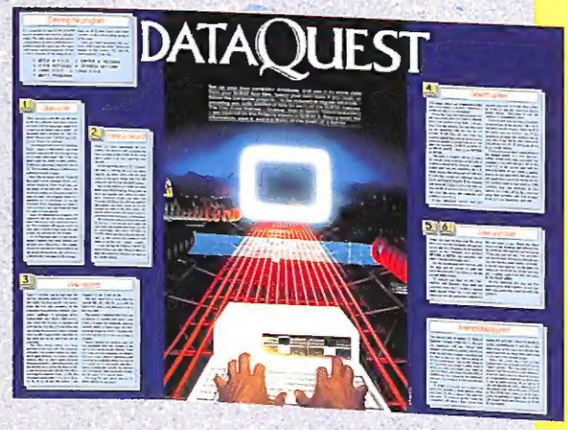

## PROJECT SHEET

- Water rocket
- Model shuttle launch
- Spinning Earth experiment

## COMING IN QUEST 3 COMMUNICATIONS

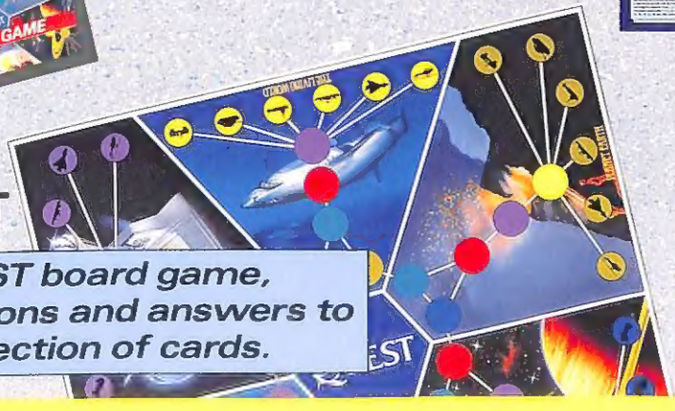

**FACT FILES include:**

- ▶Discs and videos
- ▶Animal chat
- ▶Laser printing
- ▶Modern-mail
- ▶In search of ET




## DATAQUEST

*Introducing the QUEST database*

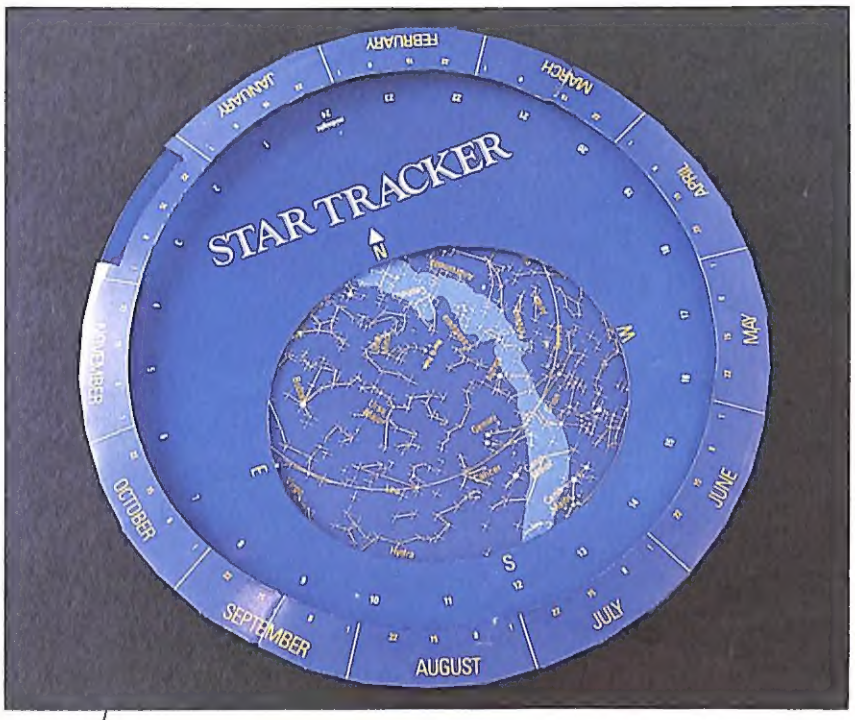



## IN-QUEST

*FREE! IN-QUEST board game, with 90 questions and answers to start your collection of cards.*

# MODEL STAR TRACKER

ASSEMBLY INSTRUCTIONS




### You will need

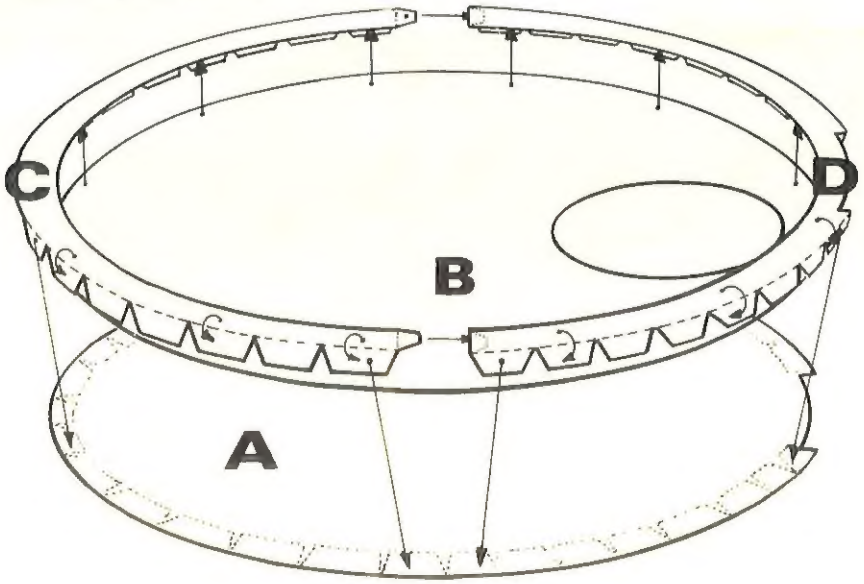
Scissors • Junior craft knife • Glue

Before cutting out the pieces, score along broken lines with a blunt edge to make folding and gluing easier.

### To make up

1 Cut out base A.
2 Cut out inner circle B and use a craft knife to cut out the window.
3 Cut out outer rims C and D. Glue tabs at the end of outer rim C to the ends of outer rim D to form a circle. Fold all tabs under.
4 Place outer rim circle face down and fit the inner circle B – also face down – under folded tabs. Press tabs firmly down over inner circle.
5 Apply glue to tabs taking great care to keep the inner circle completely free of glue.
6 Take base A and, aligning the slots, press firmly in position over the top of the glued tabs.
7 Directions for using the Star Tracker are given on the back of the model.

### Assembly Instructions



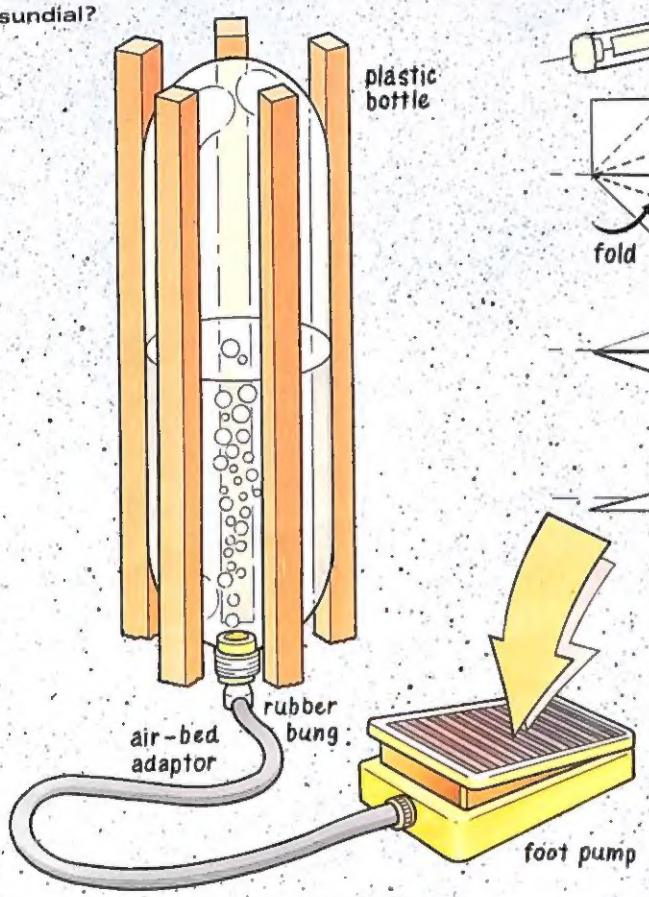

## the CONSTELLATIONS

| LATIN | ENGLISH |
|---|---|
| Andromeda | The Chained Maiden |
| Aquarius | The Water Carrier |
| Aquila | The Eagle |
| Aries | The Ram |
| Auriga | The Charioteer |
| Boötes | The Bear-Driver |
| Cancer | The Crab |
| Canis Major | The Great Dog |
| Canis Minor | The Lesser Dog |
| Capricornus | The Goat |
| Cassiopeia | Cassiopeia |
| Cepheus | Cepheus |
| Cetus | The Sea Monster |
| Cygnus | The Swan |
| Eridanus | The River |
| Gemini | The Twins |
| Hercules | Hercules |
| Hydra | The Water Snake |
| Leo | The Lion |
| Libra | The Scales |
| Lyra | The Lyre |
| Ophiuchus | The Snake-holder |
| Orion | The Great Hunter |
| Pegasus | The Winged Horse |
| Perseus | Perseus |
| Pisces | The Fishes |
| Pisces Austrinus | The Southern Fish |
| Sagittarius | The Archer |
| Scorpius | The Scorpion |
| Taurus | The Bull |
| Ursa Major | The Great Bear |
| Ursa Minor | The Lesser Bear |
| Virgo | The Maiden |

# Q PROJECTS

## 2 - MAN IN SPACE

- Will a rocket go further if you load it with more fuel?
- How can you make a model space shuttle glide to the ground?
- What is the principle of the sundial?

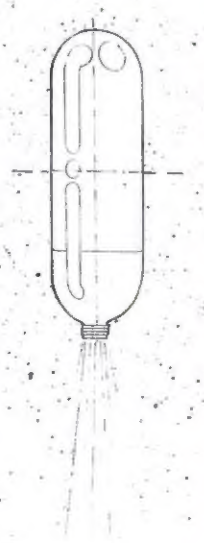



## WATER ROCKET

1 2 **3** 4 5

**Follow the instructions carefully and carry out under adult supervision.**

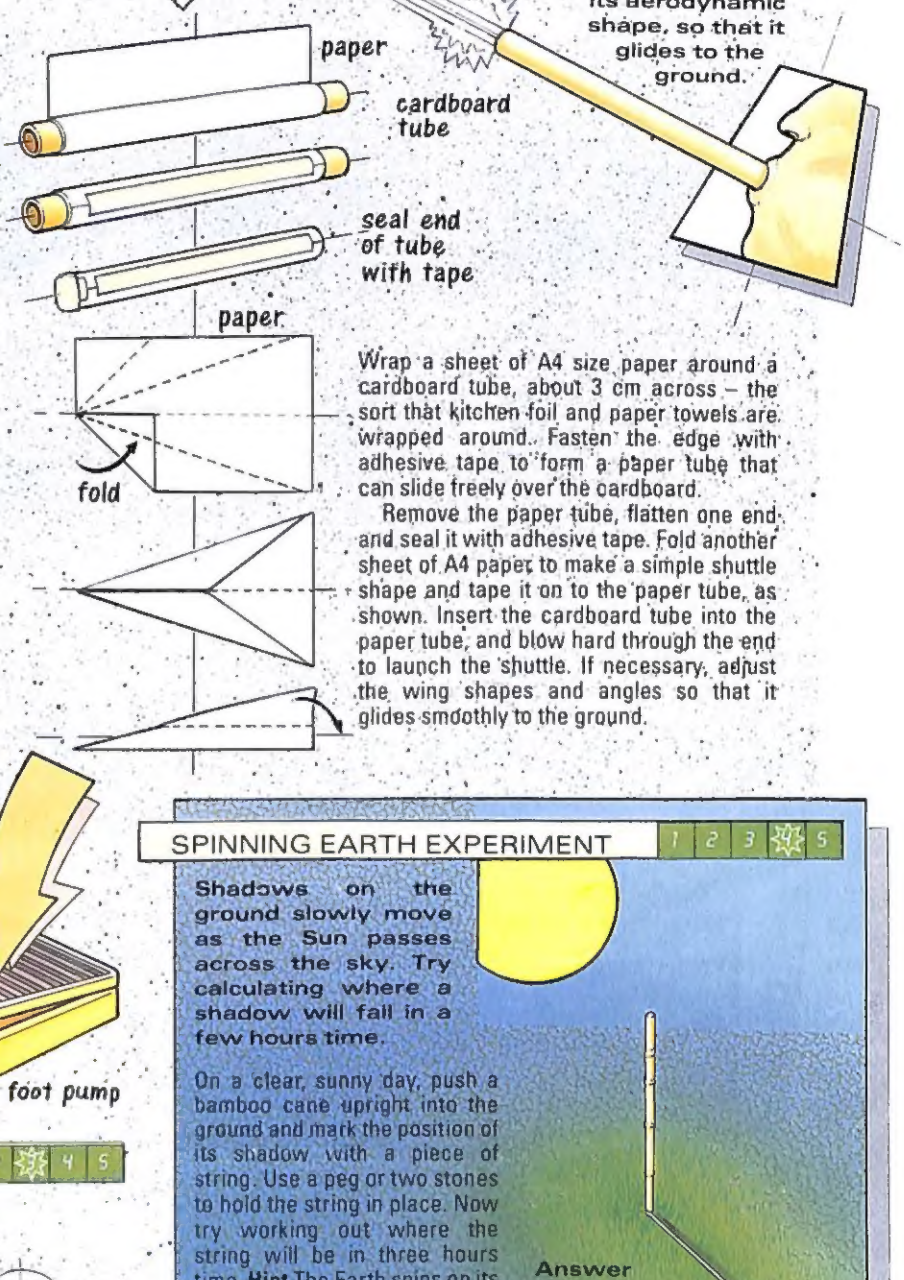
Get an empty 1½ or 2 litre plastic drinks bottle; remove any thick, protective base. Half fill the bottle with water and insert a tight-fitting cork with a hole bored through it. Connect a foot pump to the cork using an adaptor designed for inflating air beds. Go out-doors to a launch site well away from any obstacles or people. Push five sharpened sticks, just taller than the bottle, into the ground in a circle to support the bottle. Place the bottle upside-down in the circle; ensure it is upright and well supported. Stand as far away as possible and pump in air until the pressure blows the bung and forces out the water to give lift-off. See how height varies with different water levels.



## MODEL SHUTTLE LAUNCH

1 2 **3** 4 5

Launch a model space shuttle, using a blast of air to provide the thrust. Experiment with its aerodynamic shape, so that it glides to the ground.




Wrap a sheet of A4 size paper around a cardboard tube, about 3 cm across – the sort that kitchen foil and paper towels are wrapped around. Fasten the edge with adhesive tape to form a paper tube that can slide freely over the cardboard.

Remove the paper tube, flatten one end and seal it with adhesive tape. Fold another sheet of A4 paper to make a simple shuttle shape and tape it on to the paper tube, as shown. Insert the cardboard tube into the paper tube, and blow hard through the end to launch the shuttle. If necessary, adjust the wing shapes and angles so that it glides smoothly to the ground.

## SPINNING EARTH EXPERIMENT

1 2 3 **4** 5

**Shadows on the ground slowly move as the Sun passes across the sky. Try calculating where a shadow will fall in a few hours time.**

On a clear, sunny day, push a bamboo cane upright into the ground and mark the position of its shadow with a piece of string. Use a peg or two stones to hold the string in place. Now try working out where the string will be in three hours time. **Hint** The Earth spins on its axis in 24 hours, so the Sun appears to move in a complete circle - 360° - in this time. To make a sundial, mark where the shadow will be on each hour.



**Answer**

*In three hours, the Sun will move through ⅛ (or 1/8) × 360° = 45°, and the shadow will move through the same angle too*

## PROJECT INFORMATION

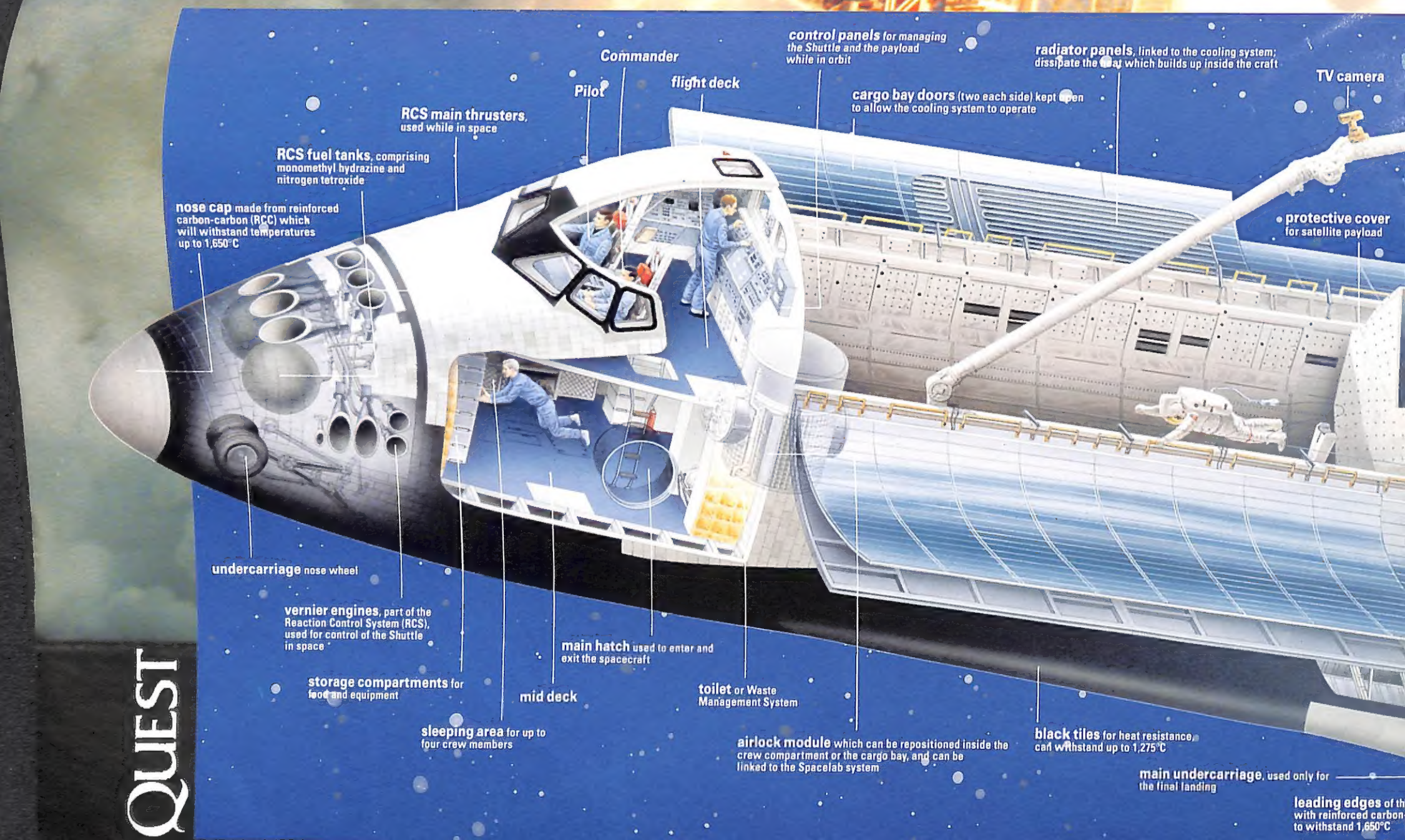
1 2 **3** 4 5

*Each **QUEST** project has its own difficulty rating: 1 very simple, 2 simple, 3 intermediate, 4 advanced, 5 complicated.*

**WARNING!**

*Parents should ensure that experiments involving sharp tools, water and electricity are supervised. The publisher can accept no responsibility for injury.*

# THE SPACE


QUEST

# SHUTTLE

## PROFILE

**Overall length** 37.19 metres

**Span** 23.79 metres

**Overall height** 17.27 metres

**Unladen weight** 68,040 kg

**Launch weight** 2 million kg

**Thrust of main engines** 2.1 million newtons (equivalent to the thrust of three Concordes)

**Fuel** main engines – liquid oxygen and liquid hydrogen
while in space monomethyl hydrazine and nitrogen tetroxide

**Speed** in orbit 28,160 km/h
on touchdown 335 km/h

**Orbital height** 1,100 km maximum

**Cargo bay length** 18 metres

**Cargo bay diameter** 4.5 metres

**Crew** up to eight

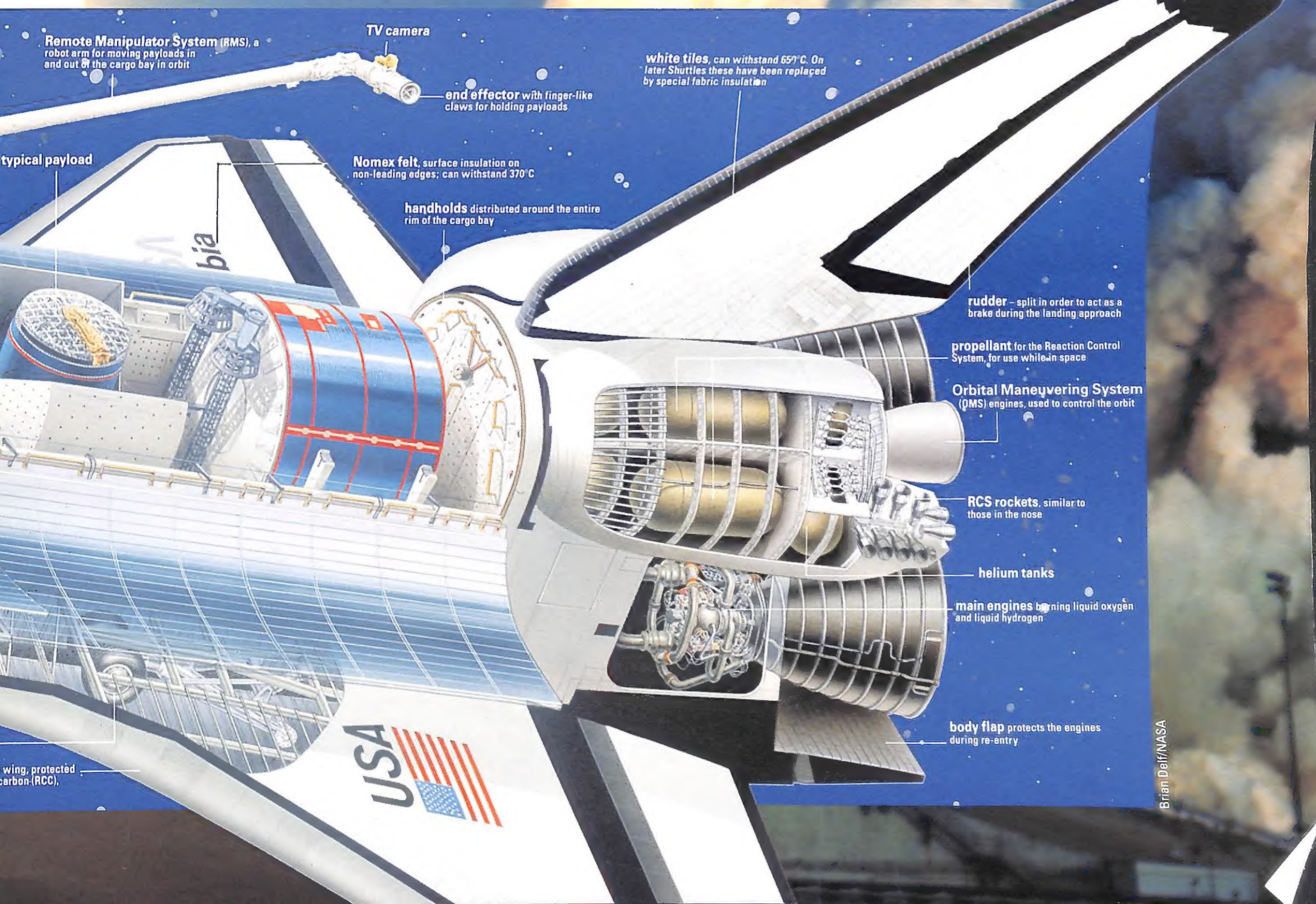
**Mission length** 7 days (average)
30 days (maximum)

**Relative cost of mission** $700 per kg (average aircraft costs are $26 per kg)

**Shuttle missions:** date of first launch

| | |
|---|---|
| *Enterprise* | Testing craft only |
| *Columbia* | 12 April 1981 |
| *Challenger** | 4 April 1983 |
| *Discovery* | 30 August 1984 |
| *Atlantis* | 4 October 1985 |

*Challenger exploded in mid-flight on 28 January 1986




Brian Delf/NASA